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jc894 U.S. PTO

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NO. 0544MH-40014

In re Application of:

**DANIEL BROWN et al.**

Serial No **To Be Assigned**

Filed: **Herewith**

For: **RULES-BASED NOTIFICATION SYSTEM**

jc920 U.S. PTO  
09/686446  
10/10/00

**TRANSMITTAL**

**BOX: Patent Application**

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Washington, D.C. 20231

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Enclosed find:

1. Transmittal with Certificate of Mailing
2. Patent Application
3. Informal drawings
4. Our firm check in the amount of \$710.00
5. Our return postcard, which we would appreciate your date-stamping and returning to us upon receipt.

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10 Oct 2000  
Date

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The Commissioner is hereby authorized to charge any additional fees which may be

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Table 1. Demographic characteristics of the study population	
Age (years)	65.0 ± 1.5
Gender (male/female)	10/10
Education (years)	12.0 ± 1.0
Occupation (years)	35.0 ± 2.0
Marital status (married/divorced/widowed)	10/0/0
Religion (Muslim/Jewish/Christian)	10/0/0
Income (USD/month)	1,200.0 ± 100.0
Health status (good/fair/poor)	10/0/0
Smoking status (smoker/non-smoker)	0/10
Alcohol consumption (yes/no)	0/10
Comorbidities (hypertension/diabetes/cholesterol)	5/5/5
Medication (yes/no)	10/0
Family history (yes/no)	5/5
Genetic testing (yes/no)	10/0
Genetic testing results (normal/abnormal)	10/0
Genetic testing cost (USD)	1,000.0 ± 100.0
Genetic testing time (hours)	2.0 ± 0.5
Genetic testing accuracy (%)	95.0 ± 2.0
Genetic testing sensitivity (%)	90.0 ± 3.0
Genetic testing specificity (%)	98.0 ± 1.0
Genetic testing positive predictive value (%)	92.0 ± 2.0
Genetic testing negative predictive value (%)	96.0 ± 1.0
Genetic testing reliability (%)	94.0 ± 2.0
Genetic testing validity (%)	93.0 ± 2.0
Genetic testing robustness (%)	91.0 ± 2.0
Genetic testing reproducibility (%)	90.0 ± 2.0
Genetic testing repeatability (%)	89.0 ± 2.0
Genetic testing consistency (%)	88.0 ± 2.0
Genetic testing precision (%)	87.0 ± 2.0
Genetic testing accuracy (%)	86.0 ± 2.0
Genetic testing sensitivity (%)	85.0 ± 2.0
Genetic testing specificity (%)	84.0 ± 2.0
Genetic testing positive predictive value (%)	83.0 ± 2.0
Genetic testing negative predictive value (%)	82.0 ± 2.0
Genetic testing reliability (%)	81.0 ± 2.0
Genetic testing validity (%)	80.0 ± 2.0
Genetic testing robustness (%)	79.0 ± 2.0
Genetic testing reproducibility (%)	78.0 ± 2.0
Genetic testing repeatability (%)	77.0 ± 2.0
Genetic testing consistency (%)	76.0 ± 2.0
Genetic testing precision (%)	75.0 ± 2.0
Genetic testing accuracy (%)	74.0 ± 2.0
Genetic testing sensitivity (%)	73.0 ± 2.0
Genetic testing specificity (%)	72.0 ± 2.0
Genetic testing positive predictive value (%)	71.0 ± 2.0
Genetic testing negative predictive value (%)	70.0 ± 2.0
Genetic testing reliability (%)	69.0 ± 2.0
Genetic testing validity (%)	68.0 ± 2.0
Genetic testing robustness (%)	67.0 ± 2.0
Genetic testing reproducibility (%)	66.0 ± 2.0
Genetic testing repeatability (%)	65.0 ± 2.0
Genetic testing consistency (%)	64.0 ± 2.0
Genetic testing precision (%)	63.0 ± 2.0
Genetic testing accuracy (%)	62.0 ± 2.0
Genetic testing sensitivity (%)	61.0 ± 2.0
Genetic testing specificity (%)	60.0 ± 2.0
Genetic testing positive predictive value (%)	59.0 ± 2.0
Genetic testing negative predictive value (%)	58.0 ± 2.0
Genetic testing reliability (%)	57.0 ± 2.0
Genetic testing validity (%)	56.0 ± 2.0
Genetic testing robustness (%)	55.0 ± 2.0
Genetic testing reproducibility (%)	54.0 ± 2.0
Genetic testing repeatability (%)	53.0 ± 2.0
Genetic testing consistency (%)	52.0 ± 2.0
Genetic testing precision (%)	51.0 ± 2.0
Genetic testing accuracy (%)	50.0 ± 2.0
Genetic testing sensitivity (%)	49.0 ± 2.0
Genetic testing specificity (%)	48.0 ± 2.0
Genetic testing positive predictive value (%)	47.0 ± 2.0
Genetic testing negative predictive value (%)	46.0 ± 2.0
Genetic testing reliability (%)	45.0 ± 2.0
Genetic testing validity (%)	44.0 ± 2.0
Genetic testing robustness (%)	43.0 ± 2.0
Genetic testing reproducibility (%)	42.0 ± 2.0
Genetic testing repeatability (%)	41.0 ± 2.0
Genetic testing consistency (%)	40.0 ± 2.0
Genetic testing precision (%)	39.0 ± 2.0
Genetic testing accuracy (%)	38.0 ± 2.0
Genetic testing sensitivity (%)	37.0 ± 2.0
Genetic testing specificity (%)	36.0 ± 2.0
Genetic testing positive predictive value (%)	35.0 ± 2.0
Genetic testing negative predictive value (%)	34.0 ± 2.0
Genetic testing reliability (%)	33.0 ± 2.0
Genetic testing validity (%)	32.0 ± 2.0
Genetic testing robustness (%)	31.0 ± 2.0
Genetic testing reproducibility (%)	30.0 ± 2.0
Genetic testing repeatability (%)	29.0 ± 2.0
Genetic testing consistency (%)	28.0 ± 2.0
Genetic testing precision (%)	27.0 ± 2.0
Genetic testing accuracy (%)	26.0 ± 2.0
Genetic testing sensitivity (%)	25.0 ± 2.0
Genetic testing specificity (%)	24.0 ± 2.0
Genetic testing positive predictive value (%)	23.0 ± 2.0
Genetic testing negative predictive value (%)	22.0 ± 2.0
Genetic testing reliability (%)	21.0 ± 2.0
Genetic testing validity (%)	20.0 ± 2.0
Genetic testing robustness (%)	19.0 ± 2.0
Genetic testing reproducibility (%)	18.0 ± 2.0
Genetic testing repeatability (%)	17.0 ± 2.0
Genetic testing consistency (%)	16.0 ± 2.0
Genetic testing precision (%)	15.0 ± 2.0
Genetic testing accuracy (%)	14.0 ± 2.0
Genetic testing sensitivity (%)	13.0 ± 2.0
Genetic testing specificity (%)	12.0 ± 2.0
Genetic testing positive predictive value (%)	11.0 ± 2.0
Genetic testing negative predictive value (%)	10.0 ± 2.0
Genetic testing reliability (%)	9.0 ± 2.0
Genetic testing validity (%)	8.0 ± 2.0
Genetic testing robustness (%)	7.0 ± 2.0
Genetic testing reproducibility (%)	6.0 ± 2.0
Genetic testing repeatability (%)	5.0 ± 2.0
Genetic testing consistency (%)	4.0 ± 2.0
Genetic testing precision (%)	3.0 ± 2.0
Genetic testing accuracy (%)	2.0 ± 2.0
Genetic testing sensitivity (%)	1.0 ± 2.0
Genetic testing specificity (%)	0.0 ± 2.0
Genetic testing positive predictive value (%)	0.0 ± 2.0
Genetic testing negative predictive value (%)	0.0 ± 2.0
Genetic testing reliability (%)	0.0 ± 2.0
Genetic testing validity (%)	0.0 ± 2.0
Genetic testing robustness (%)	0.0 ± 2.0
Genetic testing reproducibility (%)	

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**Attorney for Applicant**

# **SPECIFICATION**

Docket No. 0544MH-40014

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that we, Daniel Brown, William Lance Eason, and George A. Thompson, residing in the State of Texas, have invented new and useful improvements in a

## **RULES-BASED NOTIFICATION SYSTEM**

of which the following is a specification:

## CROSS-REFERENCE TO RELATED APPLICATION

1 This application claims the benefit of United States Provisional Application  
2 No. 60/158,732, filed October 11, 1999. This application also contains matter in  
3 common with copending US application Serial No. \_\_\_\_\_, filed on even  
4 date herewith, titled CUSTOMIZABLE USER WINDOW, which is incorporated by  
5 reference.

## BACKGROUND OF THE INVENTION

### 6 1. Field of the Invention:

7 The present invention relates generally to communications for electronic  
8 computer systems, and more specifically to a system and method for notifying a  
9 user that selected events have occurred within the system.

### 10 2. Description of the Prior Art:

11 As computer systems and data communications become increasingly  
12 widespread, more and more users are able to perform a high percentage of their  
13 daily tasks over various communication networks. For example, many users are  
14 able to obtain key information in a timely manner through the use of interconnected  
15 software and hardware systems.



Parameter	Value	Unit
Initial concentration	1.0	g/L
Initial pH	7.0	
Temperature	25	°C
Time	0, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072, 262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216, 33554432, 67108864, 134217728, 268435456, 536870912, 1073741824, 2147483648, 4294967296, 8589934592, 17179869184, 34359738368, 68719476736, 137438953472, 274877906944, 549755813888, 1099511627776, 2199023255552, 4398046511104, 8796093022208, 17592186044416, 35184372088832, 70368744177664, 140737488355328, 281474976710656, 562949953421312, 1125899906842624, 2251799813685248, 4503599627370496, 9007199254740992, 18014398509481984, 36028797018963968, 72057594037927936, 144115188075855872, 288230376151711744, 576460752303423488, 1152921504606846976, 2305843009213693952, 4611686018427387904, 9223372036854775808, 18446744073709551616, 36893488147419103232, 73786976294838206464, 147573952589676412928, 295147905179352825856, 590295810358705651712, 1180591620717411303424, 2361183241434822606848, 4722366482869645213696, 9444732965739290427392, 18889465931478580854784, 37778931862957161709568, 75557863725914323419136, 151115727451828646838272, 302231454903657293676544, 604462909807314587353088, 1208925819614629174706176, 2417851639229258349412352, 4835703278458516698824704, 9671406556917033397649408, 19342813113834066795298816, 38685626227668133590597632, 77371252455336267181195264, 154742504910672534362390528, 309485009821345068724781056, 618970019642690137449562112, 1237940039285380274899124224, 2475880078570760549798248448, 4951760157141521099596496896, 9903520314283042199192993792, 19807040628566084398385987584, 39614081257132168796771975168, 79228162514264337593543950336, 158456325028528675187087900672, 316912650057057350374175801344, 633825300114114700748351602688, 1267650600228229401496703205376, 2535301200456458802993406410752, 5070602400912917605986812821504, 10141204801825835211973625643008, 20282409603651670423947251286016, 40564819207303340847894502572032, 81129638414606681695789005144064, 162259276829213363391578010288128, 324518553658426726783156020576256, 649037107316853453566312041152512, 1298074214633706907132624082305024, 2596148429267413814265248164610048, 5192296858534827628530496329220096, 10384593717069655257060992658440192, 20769187434139310514121985316880384, 41538374868278621028243970633760768, 83076749736557242056487941267521536, 166153499473114484112975882535043072, 332306998946228968225951765070086144, 664613997892457936451903530140172288, 1329227995784915872903807060280344576, 2658455991569831745807614120560689152, 5316911983139663491615228241121378304, 10633823966279326983230456482242756608, 21267647932558653966460912964485513216, 42535295865117307932921825928971026432, 85070591730234615865843651857942052864, 170141183460469231731687303715884105728, 340282366920938463463374607431768211456, 680564733841876926926749214863536422912, 1361129467683753853853498429727072845824, 2722258935367507707706996859454145691648, 5444517870735015415413993718908291383296, 10889035741470030830827987437816582766592, 21778071482940061661655974875633165533184, 43556142965880123323311949751266331066368, 87112285931760246646623899502532662132736, 174224571863520493293247799005065324265472, 348449143727040986586495598010130648530944, 696898287454081973172991196020261297061888, 1393796574908163946345982392040522594123776, 2787593149816327892691964784081045188247552, 5575186299632655785383929568162090376495104, 11150372599265311570767859136324180752990208, 22300745198530623141535718272648361505980416, 44601490397061246283071436545296723011960832, 89202980794122492566142873090593446023921664, 178405961588244985132285746181186892047843328, 356811923176489970264571492362373784095686656, 713623846352979940529142984724747568191373312, 1427247692705959881058285969449495136382746624, 2854495385411919762116571938898990272765493248, 5708990770823839524233143877797980545530986496, 11417981541647679048466287755595961091061972992, 2283596308329	

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## BRIEF DESCRIPTION OF THE DRAWINGS

1       The novel features believed characteristic of the invention are set forth in the  
2       appended claims. The invention itself however, as well as a preferred mode of use,  
3       further objects and advantages thereof, will best be understood by reference to the  
4       following detailed description of an illustrative embodiment when read in  
5       conjunction with the accompanying drawings, wherein:

6       Figure 1 is a high-level block diagram of a system in accordance with the  
7       present invention;

8       Figure 2 is a block diagram indicating additional details of the system of  
9       Figure 1;

10       Figures 3A and 3B illustrate operation of different types of event generation  
11       techniques;

12       Figure 4 shows the type of information maintained by an event router in  
13       accordance with the present invention;

14       Figure 5 is a block diagram illustrating an operation of an alert manager;

15       Figure 6A illustrates one preferred embodiment for using a rule filter with  
16       event handlers; and

- 1           Figure 6B illustrates an alternative embodiment for using a rule filter with
- 2   event handlers.

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## DESCRIPTION OF THE PREFERRED EMBODIMENT

As will be understood by those skilled in the art, the present system and method can be used with nearly any computer system in which events occur during execution of an application, or in which data is changed. In the preferred embodiment, the operating applications are of a type which generate messages indicating the occurrence of selected events. However, as described below, the system will also work with applications which do not generate such events, and is adaptable to nearly any type of computer application.

Referring to Figure 1, a preferred embodiment of the inventive system and method is illustrated generally as reference number 10. A plurality of applications 12 operate concurrently, and may be located on a single piece of hardware, or spread among numerous machines. The applications 12 need not operate in conjunction with one another, but may be a wide variety of selected applications, of any type, which perform data processing functions.

As will be described in more detail in connection with Figure 2, applications 12 generate events 14, which are forwarded to an event router 16. Events 14 are basically messages indicating that some type of predetermined event has occurred. As defined further in connection with Figure 2, these messages may be generated directly by applications to indicate that an event has occurred in that application. For example, an application which is used to change the price of a product in a

1 database can generate an event message indicating the product number and new  
 2 price for the product. In addition, as described below, certain types of applications  
 3 12 may periodically scan persistent information, such as that stored in databases,  
 4 to determine whether data has changed. These applications can also generate  
 5 events showing that changes of the selected type have occurred.

6 Event router 16 is described in more detail in connection with Figure 4, but is  
 7 generally an application which receives incoming events 14, and routes them to  
 8 recipients which have registered to receive events of this type. For example, if a  
 9 user or another application has registered to receive notification of price change  
 10 events, the event router 16 will maintain this information. When an incoming price  
 11 change event is received by event router 16, it will then be forwarded to all  
 12 applications which have been registered to receive this event.

13 Event router 16 therefore acts as a central routing point for messages. It is  
 14 not necessary for applications 12 to know, or be able to find out, who will receive  
 15 notifications of events. Instead, applications 12 simply generate defined events and  
 16 send all of them to event router 16. Event router 16 handles the task of sending the  
 17 events to as many recipients as are registered to receive them.

18 Some events 18 are routed to various types of event handlers 20, which  
 19 then use the incoming event message to process data. In many cases, event  
 20 handlers 20 will also be classified as applications 12. In this application, event

handlers 20 are generally any applications which make some use of the information provided by incoming event messages 18.

Some events 22 are routed to an alert manager 24, which is a particular type of event handler. As described further in connection with the remaining figures, alert manager 24 handles incoming events by determining whether any incoming event requires that a notification, or alert 26, to be forwarded to a user 28. Alert manager 24 utilizes a set of rules to determine to whom, and when, notifications should be made to a user 28.

Referring to Figure 2, the types of applications 12 which generate events may be classified generally into two categories. The first category is referred to herein as business objects 30, which may include within them state machines 32 and similar operating modules. Business objects 30 generate "explicit" events, meaning that the code of the business object application explicitly generates an event to be sent to event router 16 as events occur. This capability must be programmed into business objects 30 and their state machines 32.

Explicit events are useful, in the present invention, for indicating when a single event has occurred. For example, when a sale is made, or a product changes price, or a new product becomes available, if the corresponding business objects are properly programmed events will be generated. These can be picked up by alert manager 24, and used to generate notifications.

A second kind of application that can generate events is referred to herein generally as “batch jobs.” These jobs are applications that, generally, periodically check persistent data, such as data stored in a database, and look for changes that may have occurred. For example, if an application which enters new products into a database is not one which has previously been coded as a business object, to generate explicit events on this occurrence, a batch job 34 can periodically scan a product database and determine when new products have been added. Events which are discovered by such a comparison between a previous state of an object, in a persistent memory, with the current state are referred to herein as “implicit events.”

Use of batch jobs to scan data looking for implicit events is useful both for events which occur over time, and for use with applications which are not already coded to generate the desired explicit events.

Event router 16 can route events to two different types of handlers. These can be categorized generally as synchronous handlers 36 and asynchronous handlers 38. Events which are intended for use by asynchronous handlers are preferably placed into a queue 40, from which they are later withdrawn by various asynchronous handlers 38. More than one queue 40 can be provided, and registration of a handler with the event router, to be notified of a particular type of event, will indicate whether the handler is synchronous, or asynchronous, and in the later case indicate which queue is used for the event message.

Figures 3A and 3B illustrate the operational difference between explicit and implicit events. In Figure 3A, dataflow occurring upon an explicit event is shown. In this example, a user running an application enters a new product, number 789, and identified as a “BOAT”, into the system.

When the user desires to add the product, procedure add-product is executed 42. This procedure passes the new product number, '789', and the new item description, 'BOAT', to business object 44. When the new product is set up by business object 44, an event 46 is generated and sent to event router 16. Event 46 indicates that a new product has been added, and passes the relevant parameters as part of the message.

Referring to Figure 3B, addition of the same product is illustrated when no business object is available to generate an explicit event. Instead, it will be assumed that an appropriate batch object 34 runs periodically to check a persistent data base. In this example, the batch job runs at 9:00 o'clock, and detects a table in the data base which shows two products, numbers 123 and 456. This information is retained by the batch object for future use. At a subsequent time, 9:08 in this example, a user executes the add-product procedure as was the case in Figure 3A. However, business object 50 is one which does not generate an explicit event message when the data base is updated. Thus, no message is sent to event router 16 at 9:08.

At 10:00, in this example, the batch job executes again. At this time, the information it collects is shown in table 52 and includes three products. By comparing the present table 52 with earlier table 48, the batch job determines that a new product has been added to the data base. The batch job then generates an implicit event showing that the new product has been added, and sends it to router 16.

Depending upon the implementation, it may be desirable for implicit events to carry a flag distinguishing them from explicit events to assist either the router or handler in determining how to treat the message. However, in other cases, it may not be necessary to distinguish between implicit and explicit events; only the fact that an event occurs would be of interest to the handlers.

Figure 4 indicates the type of information retained by event router 16 in order to route events which it receives. The information is shown in Figure 4 as a table, but may be stored internally within event router 16 in any desirable form.

Referring to Figure 4, the table indicates that event router 16 stores a list of types of events which are to be routed. This table is preferably dynamic, and can be added to as various handlers register with event router 16. In the example of Figure 4, EVENT TYPE 1 has three recipients, R1, R2 and R3, registered to receive a copy of this type of event. Thus, when an event of EVENT TYPE 1 is received by event router 16, recipients R1, R2 and R3 in turn receive a copy of the event message. Identification of the recipient indicates where the message will be













9 Preferably, users will be able to select from one or more menus of choices  
10 provided by the system. This simplifies the task of registering to receive alerts, and  
11 ensures a certain uniformity of notifications across all users. The conditionals used  
12 in the alert rules can be provided as templates, with the user selecting the form of  
13 the conditional and any particular values to be used. In this manner, the user can  
14 easily provide a set of alert rules to meet his or her needs.

As described previously, the alert notifications themselves can be provided in any available format supported by the system. Notification may be by e-mail or other electronic messaging as known in the art. By sending appropriate messages to any type of intermediate interface devices, messages such as pages or telephone alerts can also be made. Because the alert notification message and its type are maintained in tables in the alert manager, addition of a new technology is easily made to the alert system. All that is necessary is to provide that a selected message be sent to an appropriate handler from the alert manager, and the message can be sent to the registered user.

1           While the invention has been particularly shown and described with  
2   reference to a preferred embodiment, it will be understood by those skilled in the art  
3   that various changes in form and detail may be made therein without departing from  
4   the spirit and scope of the invention.

What is claimed is:

1. A system for generating notification messages, comprising:

a plurality of applications, each application generating event messages;

an event router in communication with the applications, wherein the router

receives the event messages;

an alert manager in communication with the router for receiving a selected

subset of the event messages; and;

a plurality of rules within the alert manager, each rule having an

associated notification, and each rule registered to act upon selected events

within the selected subset of event messages;

wherein, upon receiving a message at the alert manager, all rules

registered to act upon the message are evaluated, and for all rules that evaluate

to True, sending the associated notifications.









Variable	Mean	SD	Min	Max
Age	34.5	10.2	22	55
Gender	0.5	0.5	0	1
Marital status	0.6	0.5	0	1
Education	12.5	1.5	10	15
Income	15.2	5.8	10	25
Health status	1.2	0.8	0	2
Stress level	2.1	1.3	1	4
Life satisfaction	3.8	1.1	2	5
Work satisfaction	3.5	1.2	2	5
Family satisfaction	3.9	1.0	2	5
Community satisfaction	3.7	1.1	2	5
Overall satisfaction	3.6	1.0	2	5
Depression	1.5	0.9	0	3
Anxiety	1.8	1.0	0	3
Loneliness	1.6	0.8	0	3
Isolation	1.4	0.7	0	3
Helplessness	1.7	0.9	0	3
Worry	1.9	1.1	0	3
Anger	1.6	0.8	0	3
Sadness	1.8	1.0	0	3
Frustration	1.7	0.9	0	3
Disappointment	1.6	0.8	0	3
Resentment	1.5	0.7	0	3
Envy	1.4	0.6	0	3
Jealousy	1.3	0.5	0	3
Shame	1.2	0.4	0	3
Guilt	1.1	0.3	0	3
Hypocrisy	1.0	0.2	0	3
Self-doubt	1.2	0.5	0	3
Low self-esteem	1.1	0.4	0	3
Loneliness	1.0	0.3	0	3
Isolation	0.9	0.2	0	3
Helplessness	0.8	0.2	0	3
Worry	0.7	0.1	0	3
Anger	0.6	0.1	0	3
Sadness	0.5	0.1	0	3
Frustration	0.4	0.1	0	3
Disappointment	0.3	0.1	0	3
Resentment	0.2	0.1	0	3
Envy	0.1	0.1	0	3
Jealousy	0.1	0.1	0	3
Shame	0.1	0.1	0	3
Guilt	0.1	0.1	0	3
Hypocrisy	0.1	0.1	0	3
Self-doubt	0.1	0.1	0	3
Low self-esteem	0.1	0.1	0	3
Loneliness	0.1	0.1	0	3
Isolation	0.1	0.1	0	3
Helplessness	0.1	0.1	0	3
Worry	0.1	0.1	0	3
Anger	0.1	0.1	0	3
Sadness	0.1	0.1	0	3
Frustration	0.1	0.1	0	3
Disappointment	0.1	0.1	0	3
Resentment	0.1	0.1	0	3
Envy	0.1	0.1	0	3
Jealousy	0.1	0.1	0	3
Shame	0.1	0.1	0	3
Guilt	0.1	0.1	0	3
Hypocrisy	0.1	0.1	0	3
Self-doubt	0.1	0.1	0	3
Low self-esteem	0.1	0.1	0	3
Loneliness	0.1	0.1	0	3
Isolation	0.1	0.1	0	3
Helplessness	0.1	0.1	0	3
Worry	0.1	0.1	0	3
Anger	0.1	0.1	0	3
Sadness	0.1	0.1	0	3
Frustration	0.1	0.1	0	3
Disappointment	0.1	0.1	0	3
Resentment	0.1	0.1	0	3
Envy	0.1	0.1	0	3
Jealousy	0.1	0.1	0	3
Shame	0.1	0.1	0	3
Guilt	0.1	0.1	0	3
Hypocrisy	0.1	0.1	0	3
Self-doubt	0.1	0.1	0	3
Low self-esteem	0.1	0.1	0	3
Loneliness	0.1	0.1	0	3
Isolation	0.1	0.1	0	3
Helplessness	0.1	0.1	0	3
Worry	0.1	0.1	0	3
Anger	0.1	0.1	0	3
Sadness	0.1	0.1	0	3
Frustration	0.1	0.1	0	3
Disappointment	0.1			

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222-141 50 SHEETS  
222-142 100 SHEETS  
222-144 200 SHEETS



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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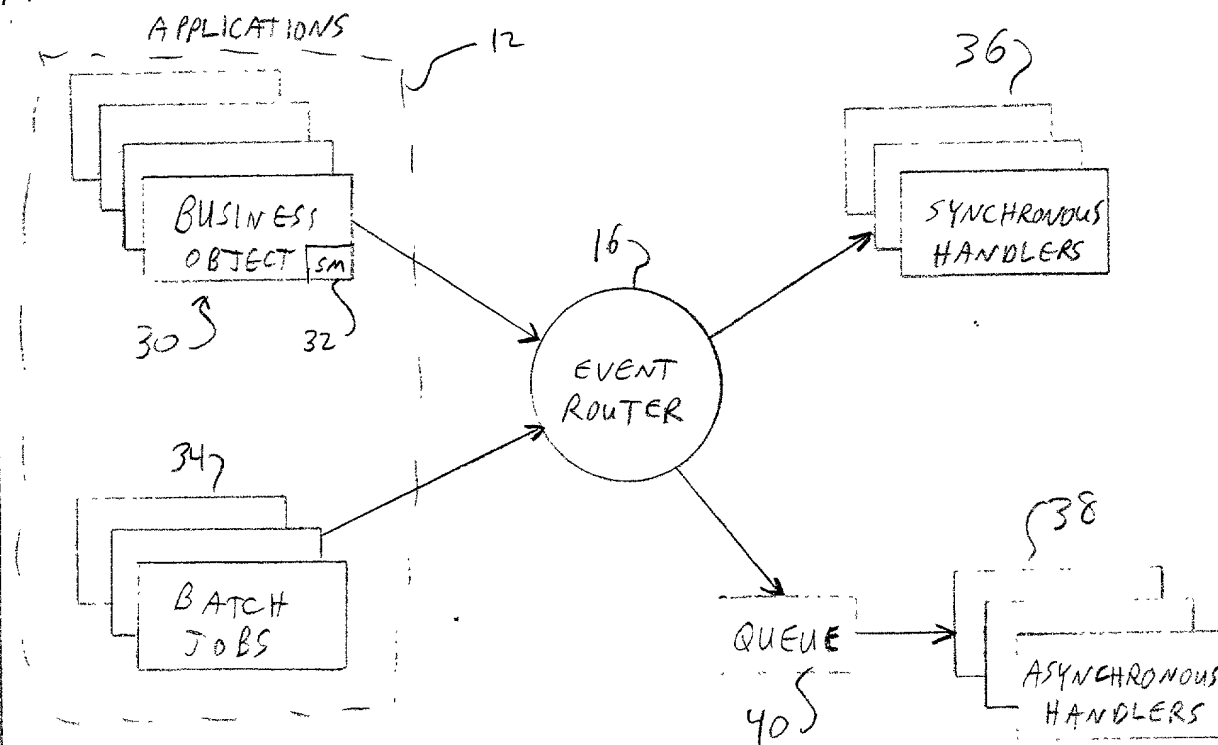


FIG 3A

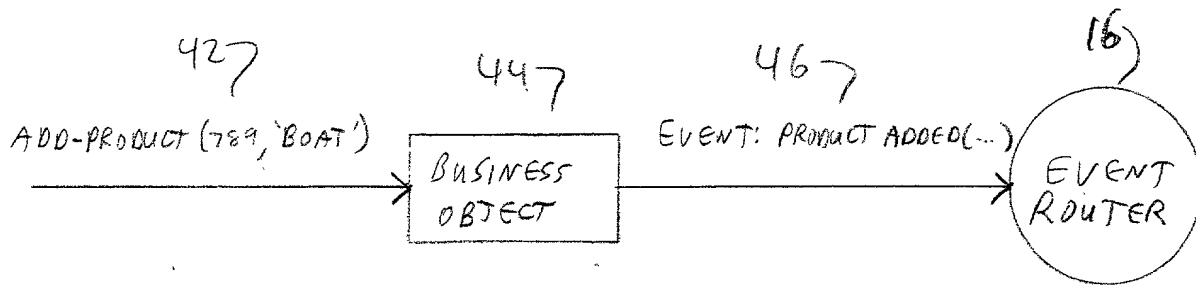


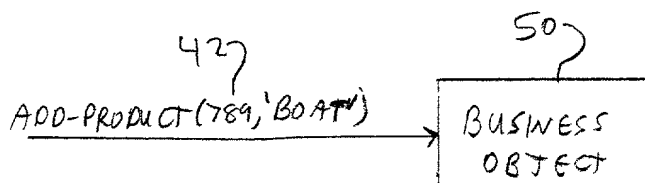
FIG 3B

9:00

48

PRODUCTS	
123 456	CAR TRUCK

9:08



10:00

52

PRODUCTS	
123 456 789	CAR TRUCK BOAT

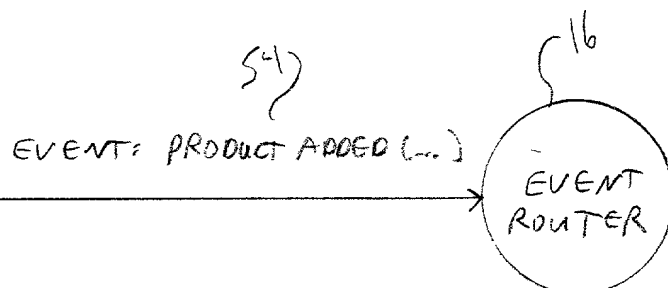
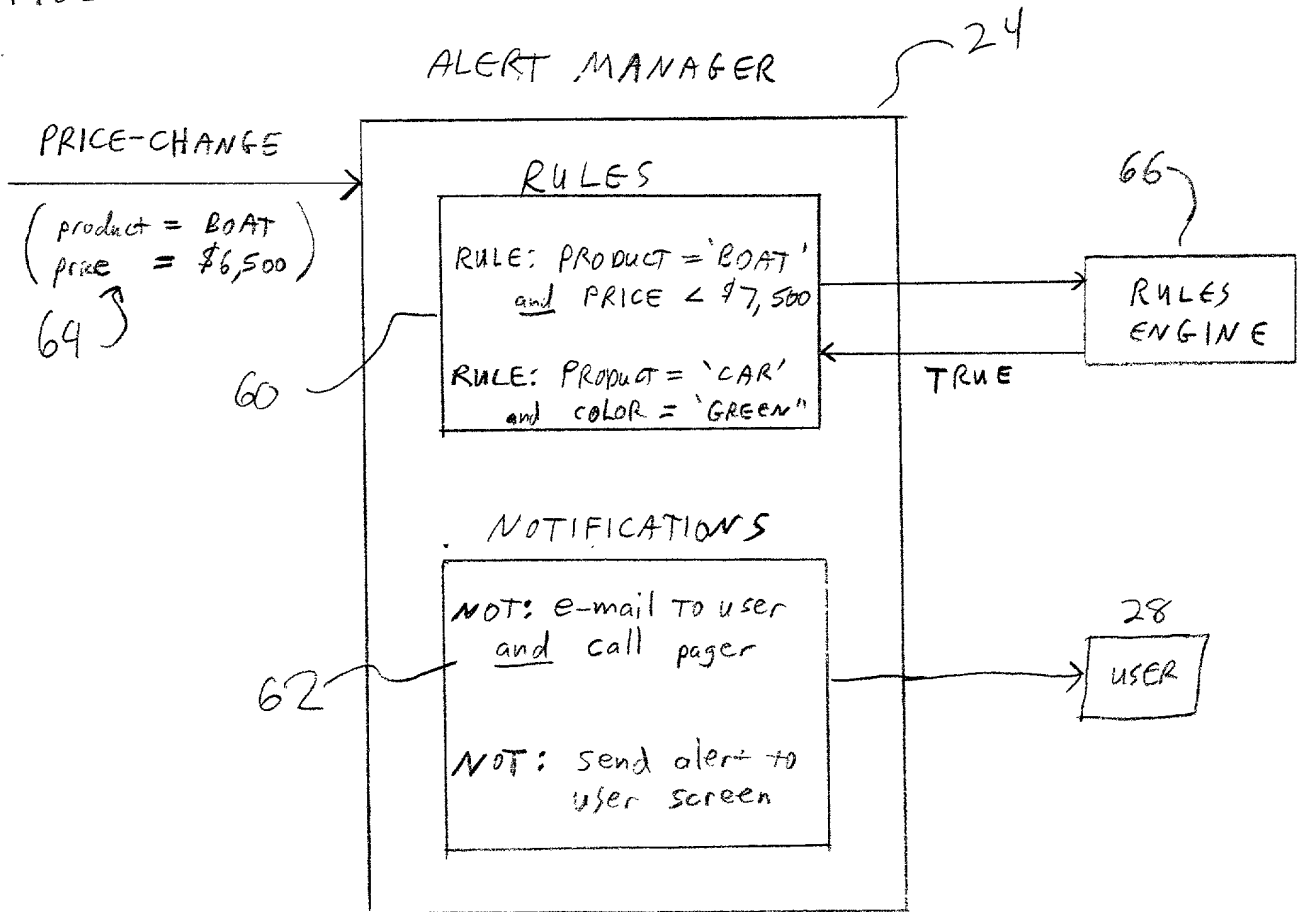


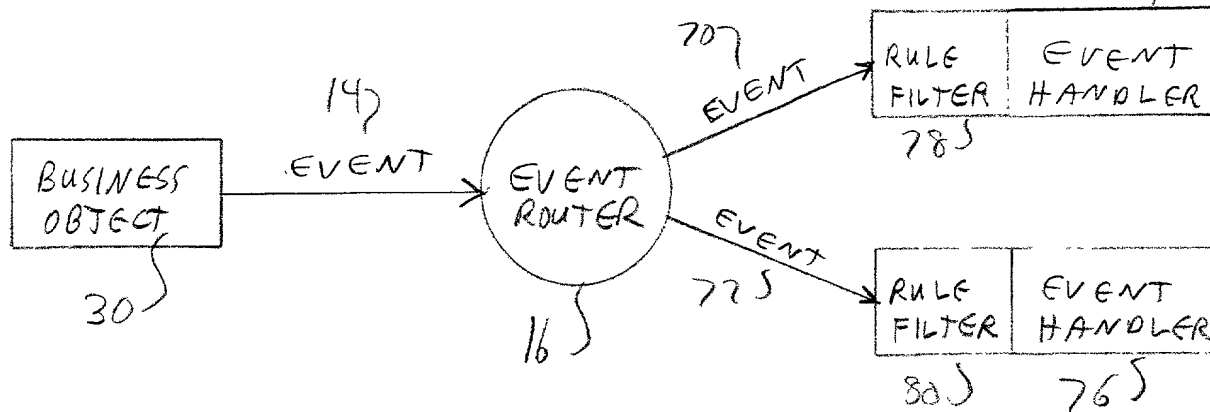
FIG 4

EVENTS	RECIPIENTS
EVENT TYPE 1	$R_1, R_2, R_3$
EVENT TYPE 2	$R_2, R_4$
EVENT TYPE 3	$\emptyset$
EVENT TYPE 4	$R_5$
EVENT TYPE 5	$R_2, R_5$
$\vdots$	

FIG 5



74-



86

